DEPARTMENT OF
HEALTH AND ENVIRONMENTAL SCIENCES
Waste Management Division
Solid Waste Program
406/444-1430
FAX # (406) 444-1499

STATE OF MONTANA

OFFICE LOCATION: 2209 PHOENIX AVE. HELENA, MONTANA
MAILING ADDRESS: PO BOX 200901 HELENA, MT 59620-0901

September 2, 1994

Kevin J. Hutchins
City of Big Timber Landfill
PO BOX 416
Big Timber, MT 59011

Dear Mr. Hutchins:

I have reviewed the additions to the Big Timber Landfill's Plan of Operations as proposed in your letter of June 2, 1994 and have the following comments:

Waste Screening Plan

The Plan as proposed meets the regulatory requirements for the waste stream anticipated at the landfill. Please remember that all of the waste screening records should be made a part of your operating record and be available for review during Department inspections.

Methane Monitoring

The regulatory requirements for methane monitoring are 25% of the LEL in facility structures and 100% of the LEL at the property boundary. Since the requirements also include that the monitoring be based on site soils, hydrogeology, potential pathways, potential barriers, water levels, and the structures and property boundaries (i.e. distance to the boundary and then the distance to other persons). The methane monitoring plan should include:

1. A map depicting the proposed locations for methane monitoring should be supplied to the Department for approval. This map should show the location of any nearby structures as well as facilities at the landfill.

2. Depth of the proposed probe locations. The methane monitoring points must be located based on the depth to the water table and the depth of any nearby refuse as well as the pathways (like sand lenses) and barriers (such as frost in the winter). The geology at the Big Timber site is such that the water beneath the landfill is mostly in what is called a confined aquifer. This indicates that most of the methane migration pathways should be above this level. Special attention should be paid to shallow sand lenses that are intercepted by the trenches at the landfill.

3. Suggested locations include on the fence line due West of the current trench, by the gate, and on the fence line due south of the trenches.

4. Culverts should be sampled. Methane/CO_2 mixtures are heavier than air and tend to accumulate in low lying areas.

5. The make and model of the methane meter selected should be supplied to the Department. It should be calibrated with an appropriate methane gas mixture and operated according to the manufacturer's instructions.

I am enclosing a copy of a simple methane plan from Valley County for your information.

Leachate Collection System

The leachate collection system must be operated so that no more than 1 foot accumulates prior to removal. The use of the same probe to measure water levels in the leachate system and the ground water monitoring wells is strongly discouraged. One accidental cross contamination will more than nullify any cost savings of not using dedicated equipment. A simpler method, such as the use of a series of 1 inch PVC pipe sections to probe the leachate riser might be just as effective and cheaper.

The design of the current cell's leachate collection system does not meet the new requirements of Department regulations adopted as a result of the EPA's Subtitle D rules. The next cell (trench) will require a liner and leachate collection system that meets the requirements of ARM 16.14.506. Unfortunately, the Department is not in the landfill design business and will only be able to review designs presented to insure that they meet the regulatory requirements. I would urge you, if you will be continuing to use the landfill beyond the life of the current cell, to begin the design process at least a year in advance of the need for additional space. The design, bidding, and construction may take longer than anticipated. Design requirements are specified in ARM 16.14.506.

Ground Water Monitoring

There appears to be some confusion regarding the status of ground water monitoring at the Big Timber Landfill. As Patricia Potts stated in her letter of April 19, 1994, the seven wells present at the site are adequate to provide for the initial hydrogeological characterization of the site but are not necessarily adequate as a monitoring network. In that letter she also said that Big Timber should immediately begin monthly water level measurements so that an assessment of the flow direction could be made in August and a determination of the adequacy of the existing well placement could be

made prior to October 9, 1994. Since these measurements were not performed, the Department does not have the additional information required to make a decision on these matters. Please commence the required monthly water level measurements at once.

One of the primary reasons for sampling all seven wells was the ability to create a sufficient population of samples for the required statistical evaluation of sampling results. The lack of water level measurements may require that the Department, instead of being able to evaluate a proposed monitoring network, may have to require that a second round of sampling be conducted on all seven wells again in the spring, rather than concentrating the sampling on a reduced number of properly located wells. Please consult with Huntingdon Chen-Northern on the groundwater data analysis required by ARM 16.14.706(12).

A sampling and analysis plan for the landfill is also required. For the first event, the Standard Operating Procedures used by Huntingdon will suffice as this firm has been active at several landfills in Montana and is familiar with Department regulations. They can advise you on the requirements of ARM 16.14.706(1).

Closure Plan

For the time being, the Department has accepted the closure plan as presented on Plan Sheet 4 of 9. "Final Contour Plan" of the Damschen and Associates plans for the landfill dated February 1990. This design may have to change as the Big Timber Landfill progresses to lined cells. The permeability of the final cover infiltration layer must contain a minimum 18 inches of earthen material and have a permeability less than or equal to the permeability of any bottom liner, barrier layer, or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less. I would also call your attention to the construction QA/QC requirements of final cap design specified in ARM 16.14.506(12). The requirements normally require the services of a professional engineer.

The closure of landfill units must be completed within 180 days of the start of closure activities. The unit must be revegitated within one year. The vegetation of closed areas should be done with a grass mix approved by the Soil Conservation Service for the area.

A notation must be placed on the deed to the property indicating that it was used as a landfill.

An estimate of the cost of a third party to close the largest area of the landfill requiring final closure (and proof of the financial mechanism to provide for the closure) must be provided to the Department by April 9, 1994. This estimate must be annually updated and appropriately funded. Must Montana towns do not have the

financial depth to provide the required financial assurance without setting up a dedicated trust fund. Financial assurance requirements are delineated in ARM 16.14.540.

A 30 year post closure care period is also required. These requirements are specified in ARM 16.14.531(1) and include:

(a) Following closure of each Class II landfill unit, the owner or operator must conduct post-closure care. Post-closure care must be conducted for 30 years, except as provided under (b) of this subsection, and consist of at least the following:

(i) Maintaining the integrity and effectiveness of any final cover, including making repairs to the cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

(ii) Maintaining and operating the leachate collection system in accordance with the requirements in ARM 16.14.506. The department may allow the owner or operator to stop managing leachate if the owner or operator demonstrates that leachate no longer poses a threat to human health and the environment;

(iii) Monitoring the ground water in accordance with the requirements of ARM Title 16, chapter 14, subchapter 7, and maintaining the ground water monitoring system, if applicable; and

(iv) Maintaining and operating the gas monitoring system in accordance with the requirements of ARM 16.14.521.

Following the thirty year post closure care of the unit, a certification by a P.E. must be submitted to the Department.

Run-off control and the Montana Pollution Discharge Elimination System (MPDES) Permit

Barry Damschen sized the run-off detention pond to handle the 24 hour, 25 year precipitation event. This meets current requirements. Your Operations Plan should also reflect a commitment to use appropriate Best Management Practices (BMP's) to eliminate possible point and non-point sources at the landfill. I have attached a copy of the EPA suggestions on BMP's at landfills for your reference.

Because the Big Timber Landfill pond design includes two potential discharge points, the spillway and the pipe, it will also require a Stormwater Discharge Permit from the Water Quality Division. Please contact Roxanne Lincoln at 444-5338 for the appropriate application form.

I hope this review of your submittal has been helpful. We understand that landfill operations under the new rules required by the EPA is

much more complex than before. If we can be of further help, please feel free to contact any of us at the Solid Waste Program.

Sincerely,

F. Patrick Crowley
Solid Waste Regulatory Lead

Enclosures: Valley County Methane, EPA BMP's

Big Timber

File:Twin Bridges Landfill\Sweet Grass County
Path:H:\cb5403\wp\landfill\BIGT.OPS

June 2, 1994

Department of Health and
Environmental Sciences,
Solid and Hazardous Waste Bureau
Helena, MT 59620

Re: Operation plan additions.

Dear Sirs,

Enclosed you will find the information you requested. The City understands that this is the first draft of the proposed operational plan changes. Any changes or ideas from your department will be appreciated.

I would like to thank Lora Dando for her time and understanding, Jim Wilbur for his willingness to face the mis-informed citizens of Big Timber, and Pat Crowley for his simplistic explanation of the rules and regulations.

I am sure I will hear from you soon.

Sincerely,

Kevin J. Hutchins

Kevin J. Hutchins

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MONTANA DEPARTMENT OF HEALTH
AND ENVIRONMENTAL SCIENCES

WASTE SCREENING

Big Timber has in place a waste screening program during the regular day to day operations of the Solid Waste Department. The Solid Waste personnel come into actual physical contact with all residential waste generated within the city limits. The Solid Waste personnel will accept liquid wastes from residential customers, with certain restrictions. These restrictions include:

1. Paint
   a. two gallons maximum per stop
      1. the city would prefer the lids on the cans be removed for 3-4 days to allow the VOC's to escape.

2. Used crankcase oil
   a. one gallon maximum in clear milk jug.

3. No 5 gallon container of any liquid will be accepted.

COMMERCIAL CUSTOMERS

Most commercial customers are picked up on a by the can basis therefore the city personnel can monitor the waste as it is being dumped into the truck. Any questionable waste is removed and the business owner is notified.

Presently, Big Timber is home to one of Montana's finest firearms manufacturers, Shiloh Rifle Company. The rifle company uses water soluble lubricating oil on their machines, and also uses a spinner to reclaim cutting oil from their metal filings.

Big Timber's garages and service stations either use their crankcase oil as fuel for heaters or contract to have the oil removed. All oil filters are punctured and drained before entering the waste stream.

AT THE LANDFILL

Customers at the landfill generally bring refuse to the landfill in the back of a pick-up. The city personnel inspect each load before it is dumped at the working face.

The Big Timber landfill has very few loads that are larger than pick-up size. These loads are generally dump truck and stock truck size. The larger loads are inspected after being dumped at the working face.

City personnel continue to inspect all refuse at the working face during the compaction and burying procedure.

The city will construct a simple waste screening pad following the guidelines on page 37 figure 7 of the Waste Screening at Municipal Solid Waste Management Facilities guidebook. This pad will be used for all questionable loads that enter the landfill.

If the city personnel find any waste that is unacceptable, we will contact the department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau, and we will also contact Chen-Northern, Inc.

METHANE MONITORING

Landfill gas (LFG), produced during biodegradation of the waste can migrate through soils. Methane and Carbon Dioxide are the primary constituents. Methane is explosive and can collect in buildings or other confined spaces. Methane is explosive at concentrated levels between five percent (LEL) and fifteen percent (UEL) in air.

Methane is lighter than air and tends to rise through refuse or soil and vent into the atmosphere. A portable methane gas meter will be used to measure the concentration 4 times per year in facility structures, in leahcate riser, and at the facility property boundaries.

The Big Timber landfill operators will ensure that the concentration of methane gas generated by the facility does not exceed 25% of the lower explosive limit for methane at those areas that are monitored.

Need map of L.F. showing proposed locations.

1) What meter will be used. (Methane combustible)

2) Quarterly monitor.

3) 100% LEL required —

Send.

LEACHATE COLLECTION SYSTEM

Purpose

The leachate collection system is designed to collect and convey leachate from the bottom of each pit. A series of perforated pipes are used for this purpose.

In order to detect and collect any leachate that may be generated in the most effective and economical method possible, the operation plan has been developed such that the base elevation of the various trenches slope in a down gradient direction toward the south side of the landfill.

Installation

Filter fabric was placed in the 3:1 slope trench for the leachate pipe.

A layer of coarse aggregate was placed over the fabric, then the pipe was put in. Another layer of coarse aggregate was placed over the pipe, and geo textile fabric was put down to help stop migration of waste and clay particles through the coarse aggregate that may clog the collection pipes.

Cleanout Risers

Cleanout risers are located on the west side of the trench and out of the fill area. The riser is protected by a six foot piece of steel pipe to help guard against accidental damage by landfill equipment.

Monitoring

The city personnel will check monthly for any leachate in the collection system. If leachate is found in sufficient quantities to cause alarm the city will contact the Department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau and Chen Northern Inc.

The leachate riser is equipped with a steel cap that is padlocked at all times. After testing for leachate in the collection system, the probe must be cleaned to prevent the contamination of any groundwater monitoring wells. The probe will be used to measure the groundwater monitoring wells, also. The cleaning or decontaminating will be done per manufacturer's instructions.

GROUNDWATER MONITORING

The Big Timber landfill currently has 7 monitoring wells. The city will have all 7 of those wells tested for the required list of parameters/constituents listed in Table 1 of ARM 16.14.706. Upon the department's recommendation, the lab will also check for dichlorodifluoromethane in the down-gradient wells.

The city will also initiate a program for measuring water levels in all of the existing wells on a regular monthly basis. This program would coincide with the leachate collection system check.

The city understands this information will be instrumental in determining which wells will be included in the approved monitoring network, and if any additional wells will be needed.

With this information the city will establish a regular schedule for the required semi-annual ground water sampling. This sampling will coincide as closely as possible with high and low water periods during the year.

The firm of Chen-Northern, Inc. did the initial testing of all the wells and in all probability will do any subsequent testing. The city will advise Chen-Northern that the Department requires a Statement of Qualifications before any testing is done.

CLOSURE PLAN

Closure of filled trenches will be the responsibility of the City of Big Timber. Closure activities described below will take place sequentially as areas of the site are brought to final grades.

Closure of Filled Areas

The Big Timber operation plan is to close off a portion of the cell as the filling operation progresses. Final Closure will begin within 30 days after receiving the last shipment of waste. Final closure will be proceeded by contacting the Montana Department of Health and Environmental Sciences, Solid and Hazardous Waste Division before closure activities begin.

Closure will consist of placing a buffer soil layer, installing a clay barrier layer, placing eighteen inches of cover soil and six inches of topsoil and seeding with native grasses.

Access to the site following final closure will be controlled by providing a locked gate. The fence surrounding the property will be maintained.

The City personnel will make a monthly check for any erosion problems and take corrective action if needed.

Feb. 90

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To determine the approximate life of the landfill, the engineer estimates that the in-place density of the waste will be in the neighborhood of 1,000 lbs/cubic yard. This is based on the fact that the City will be utilizing a Track Loader for compacting the waste and applying the daily cover. Several studies have indicated that typically in-place densities of waste at landfills vary from approximately 400 lbs/cubic yard where very little compaction is provided to 800-1,000 lbs/cubic yard where larger (D-8) dozers or track loaders (Cat 973) are used and 1,200-1,400 lbs/cubic yard when landfill compactors with sheepsfoot wheels are used. Therefore the 1,000 lbs/cubic yard in-place density seems to be a realistic estimate for the landfill. Based on this coupled with the estimate that the site will receive approximately 2,000 tons per year of waste, it is projected that the site will have an estimated life of 61 years.

4. Drainage Control

When designing a landfill it is important that two criteria be met concerning drainage. These include: 1) making sure that no run-off that is generated off the site runs onto and over the areas that are filled with waste and 2) making sure that there is positive drainage from the waste filled areas to off the site.

Due to the topography of the area and the design of the trench locations, it is not anticipated that any surface drainage can enter the active landfill area from the west, east and south sides. The plan incorporates a ditch along the northwest, north and northeast sides of the site to divert any run-off in these areas from entering the site in these areas. In regard to drainage within the confines of the landfill areas, the site has been designed to slope away from all areas filled with waste. It is the intent to attain the final contours as designed after each area is completed. During the operation of each trench, it is also intended to fill from the north to the south in order that each trench will drain as it is filled.

5. Leachate Control

Due to the low amounts of moisture that fall in the area coupled with the on and off-site drainage control that has been included in the design of the landfill, it is very unlikely that any significant amount of leachate will be generated at the landfill site. If leachate is generated at the site, it will be important to monitor and contain the leachate on the site. In order to detect and collect any leachate that may be generated in the most effective and economical method possible, the operation plan has been developed such that the base elevation of the various trenches slope in a down gradient direction towards the south side of the landfill. If any leachate is generated to the degree that containment and collection is needed, a collection system could be installed along the southern end of each trench.